CX – 38

Addendum Regarding 2016 Conditions at an Unauthorized Suction Dredging Site To An Investigation of Stream Channel Modifications at Unauthorized Suction Dredging Sites on the South Fork Clearwater River, October 7 and 8, 2015

Dan Kenney
North Zone Fisheries Biologist
Nez Perce-Clearwater National Forests
February 3, 2016
Addendum Added May 12, 2017

Introduction. As discussed in original February 3, 2016 report, I documented conditions in the South Fork Clearwater River channel at sites associated with observed unauthorized suction dredge mining activities during the summer of 2015. Attached to the report were two appendixes which displayed photos of the several sites on October 7 and 8, 2015, along with measurements and observations made on those dates. On September 13, 2016, my field crew took additional photos, measurements, and observations at the sites. This addendum describes conditions at a specific site (Site #14 in the original report) in September 2016 and compares these conditions with those in 2015.

Discussion. As expected, the visible and measured condition of the stream channel at Site #14 had changed between October 2015 and September 2016, presumably and primarily because of intervening peak streamflows. The measured/calculated daily mean streamflow at the U.S.G.S. "Elk City" streamflow gage on October 8, 2015 was about 32 cubic feet per second (cfs), and corresponding metric on September 13, 2016 was about 26 cfs. In between these dates, the peak streamflow measured at the gage was 1,750 cfs on April 23, 2016. This peak flow volume for the 2016 water year compares to the 1,967 cfs which is the mean peak flow for the period of record for the gage (range: 706 to 4,040 cfs). So, the peak flow which affected stream channel morphology at Site #14 in the interim between the two observation dates was slightly below the mean for the gage site.

Figure 1 shows the measured and photographed conditions at Site #14 on 8 October 2017, and a page from Appendix A in the original report. Tables 1 and 2 compare measurements of dimensions of dredge holes and tailings piles at Site #14 in both 2015 and 2016 and display the change in these measurements.
Figures 2 and 3 and 3 and 4 provide comparison photos of specific features within Site #14 in both 2015 and 2016. In general, the measurements and photos show that the features, again, as expected, are smaller/less prominent in 2016 compared to 2015. The measurements should be regarded as fairly approximate, as the edges of the features were often not distinct, particularly in 2016. Additionally, the visual appearance of the dredge holes and tailings piles was more distinct in 2015 than in 2016 because their recent disturbance revealed a combination of less algae and fine sediment accumulation, both of which had time to recover in 2016.

A comparison of measurements and photographs shows that the modifications of the stream channel at Site #14 caused by unauthorized suction dredging in the summer of 2015 had substantially reverted toward the pre-dredging condition by September 2016. This change was evident both in terms of substrate size distribution and substrate elevation. The area and volume of the dredge holes was generally reduced, presumably because small and moderate-sized substrate particles in the form of bedload at high flow velocity had been swept into and lodged into the holes. This is evident from both the measurements and photos. The area and density of fine sediment (sand and small gravel) in the areas identified in 2015 as tailings piles was reduced in 2016 (presumably, again, because of interim occasions of high flow velocity), particularly the ubiquity of the fine sediment within the tailings pile areas and any apparent depth to these fines.

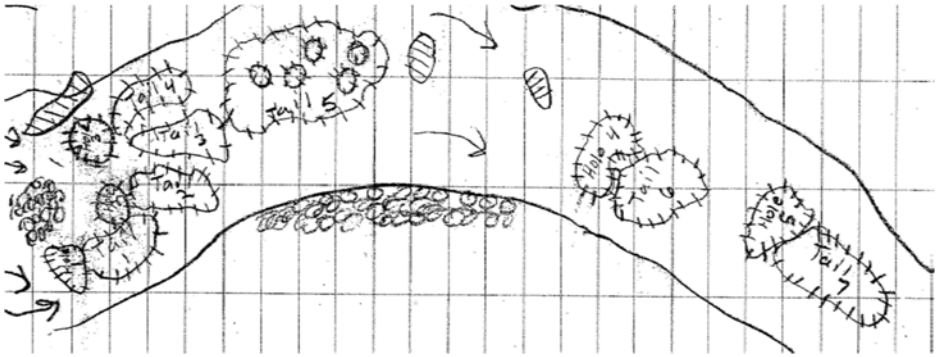
In summary, the channel modifications caused by the unauthorized dredging at Site #14 in 2015 recovered toward their pre-dredging condition somewhat in the following year, but were still observable. Subsequent peak flow events will likely continue to change substrate conditions at the site, but because stream channel conditions are naturally unstable to a greater or lesser extent, the site is unlikely to ever return to the pre-dredging state.

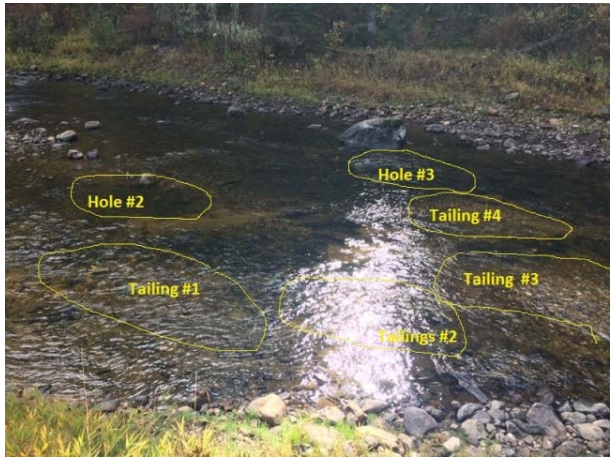
SFCR Unauthorized Site #14, October 8, 2015

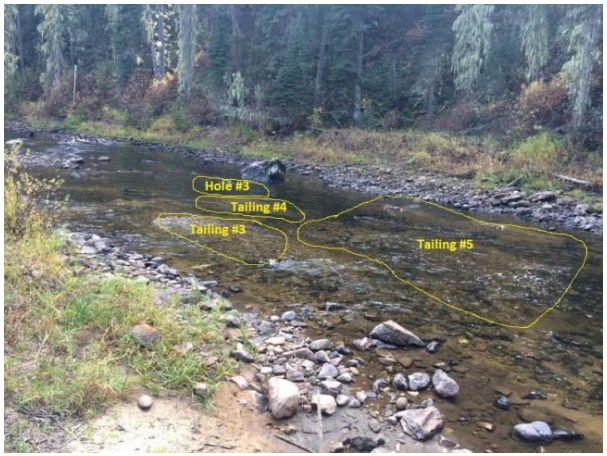
Upper feature location	Hughes Site?	Dredge Fines?	WPM?	Notes:
UTM 11 609175E, 5075244N	2	No	No	Some dredge holes/tailings intersperse/indistinct

	Length (m)	Width (m)	Depth (m)	Dredge Hole Totals	
Hole #1	10.4	4.9	0.7	Area: (m^2):	146
Hole #2	3.5	3.1	0.7	Adjusted Area (m^2):	116
Hole #3	3.8	2.6	0.6	Adj. Area (ft^2):	1253
Hole #4	6.3	7.9	1	Adj Volume (yd^3)	86
Hole #5	5.6	4.3	1.1		

	Length (m)	Width (m)	Dredge Tailings Totals	
Pile #1	3.6	2.2	Area: (m^2):	234
Pile #2	5.3	3.9	Adjusted Area (m^2):	187
Pile #3	6.8	2.6	Adj. Area (ft^2):	2017
Pile #4	6.2	2.1		
Pile #5	17.6	4		
Pile #6	6.7	6.3		
Pile #7	8	7.8		







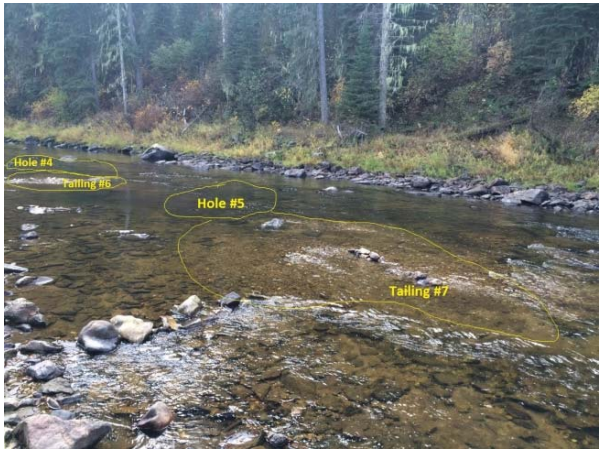


Figure 1. Appendix A, Site 14, from February 3, 2016 original report

		Length (m)		Width (m)		Depth (m)	
		2015	2016	2015	2016	2015	2016
Site # 14	Hole #1	10.4	10.4	4.9	4.2	0.7	0.5
	Hole #2	3.5	2.3	3.1	1.5	0.7	0.6
	Hole #3	3.8	1.7	2.6	1.6	0.6	0.6
	Hole #4	6.3	5.4	7.9	5.8	1	0.7
	Hole #5	5.6	5.8	4.3	3.6	1.1	0.8

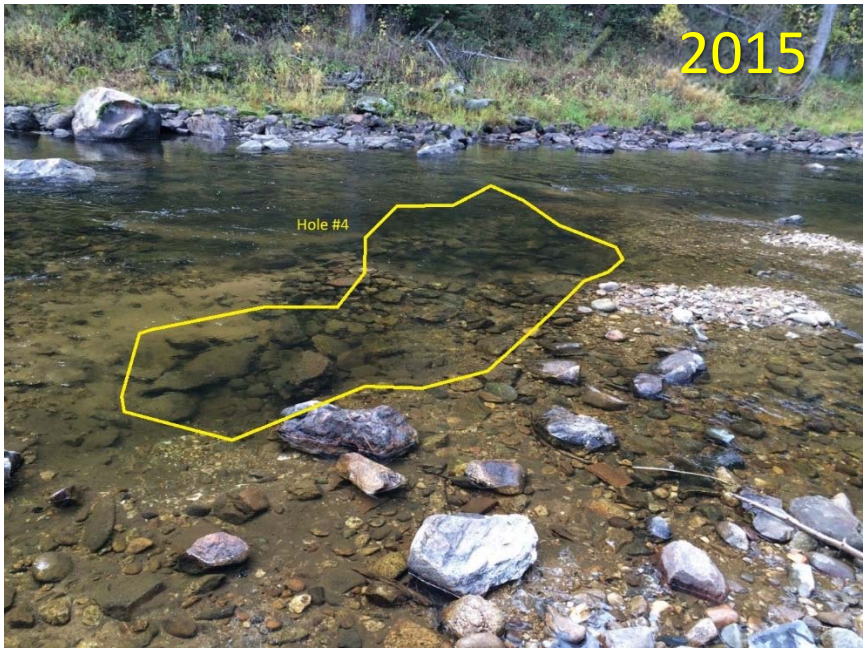
	Dredge Hole Totals		
Holes Summed	**2015**	**2016**	**Change**
Area: (m^2):	146	102	**-30%**
Adjusted Area (m^2):	116	82	**-30%**
Adj. Area (ft^2):	1253	878	**-30%**
Adj Volume (yd^3)	86	36	**-58%**

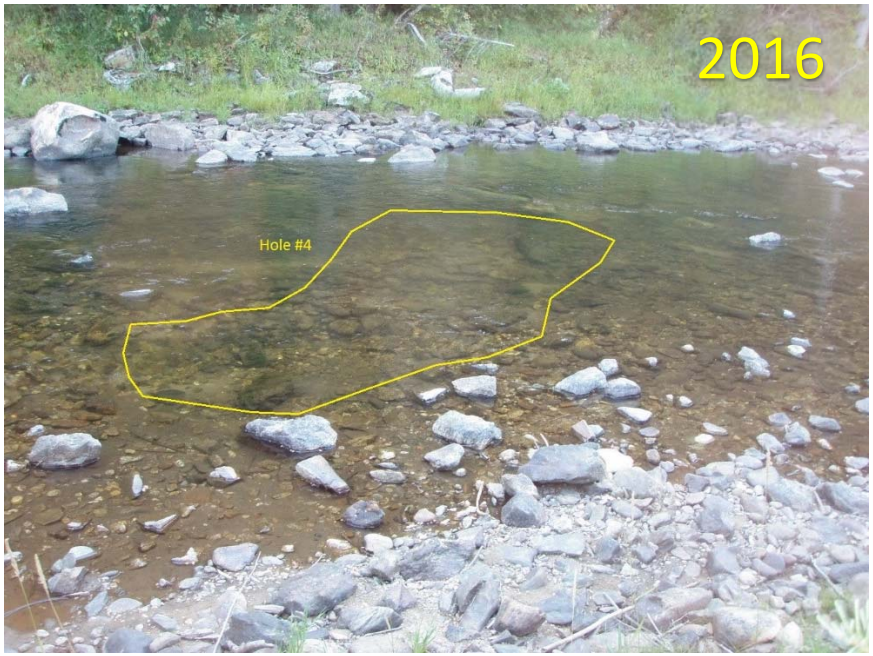
Table 1. Original data from dredge holes at Site 14, gathered 5 October 2015 compared with dredge hole data gathered at same site 13 September 2016.

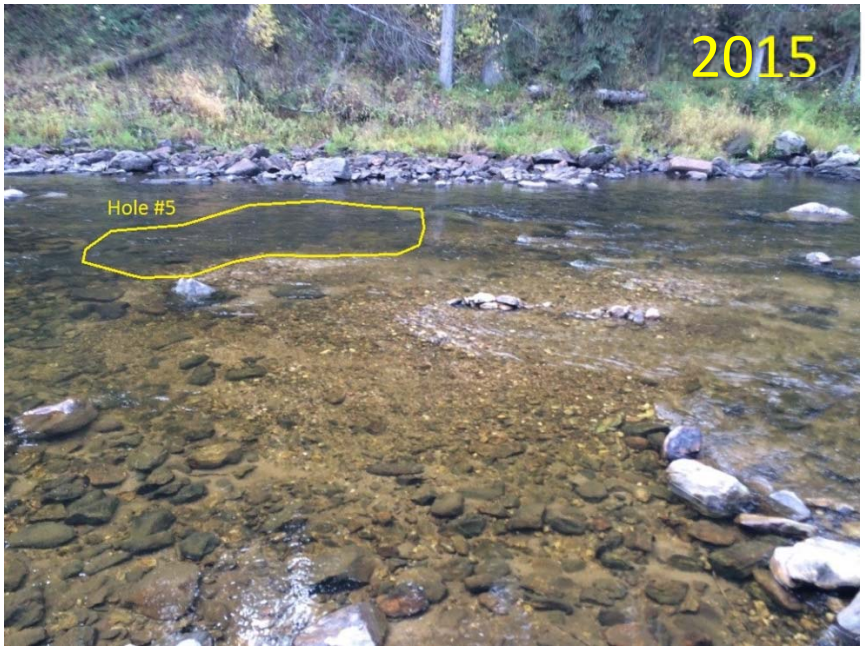
		Length (m)		Width (m)	
		2015	2016	2015	2016
Site # 14	Pile #1	3.6	8.7	2.2	4.6
	Pile #2	5.3	5.9	3.9	3.4
	Pile #3	6.8	n/a	2.6	n/a
	Pile #4	6.2	n/a	2.1	n/a
	Pile #5	17.6	9.7	4	5.4
	Pile #6	6.7	7.1	6.3	3.5
	Pile #7	8	7.5	7.8	5.2

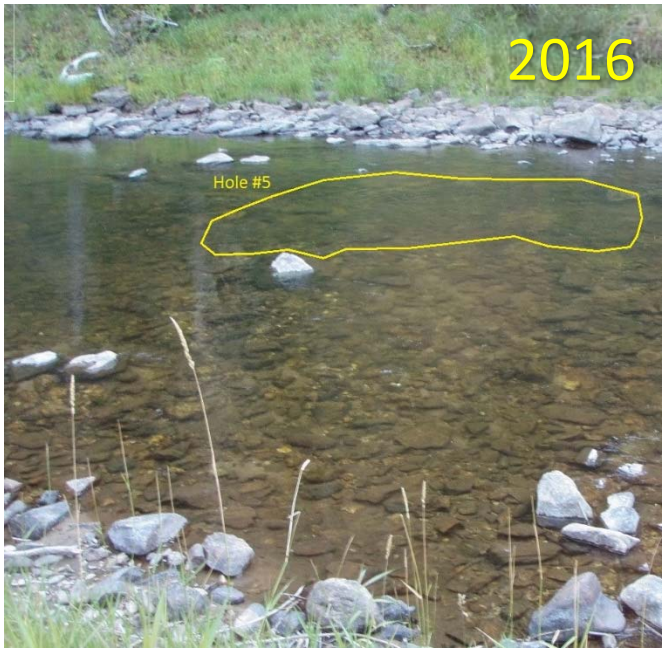
	Dredge Tailings Totals		
Tailings Summed	**2015**	**2016**	**Change**
Area: (m^2):	234	176	**-25%**
Adjusted Area (m^2):	187	141	**-25%**
Adj. Area (ft^2):	2017	1518	**-25%**

Table 2. Original data from dredge tailings piles at Site 14, gathered 5 October 2015 compared with dredge tailing pile data gathered at same site 13 September 2016. Height/depth of piles not recorded in either year, but pile area identifiable only be substrate size in 2016, as little to no visible "thickness" was observable.









Figures 2 and 3 (top). Approximate outline of dredge hole #4 at Site 14 in 2015 and 2016.
Figures 4 and 5 (bottom). Approximate outline of dredge hole #5 at Site 14 in 2015 and 2016.